

# ***Headquarters U.S. Air Force***

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## ***Airfield Safety Study- Golf Course Redesign Concept Plan***



*375<sup>th</sup> Civil Engineer Squadron  
Scott AFB, IL*

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**5-8 May 03**



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# *Tasking*

***Develop a detailed concept design for alterations to the golf course that will resolve existing conflicts with airfield clearance criteria***

- **Address realignment/relocation of existing golf holes that currently encroach the airfield Primary Surface setback to allow quantification of environmental impact analysis, design, construction, and establishment costs**



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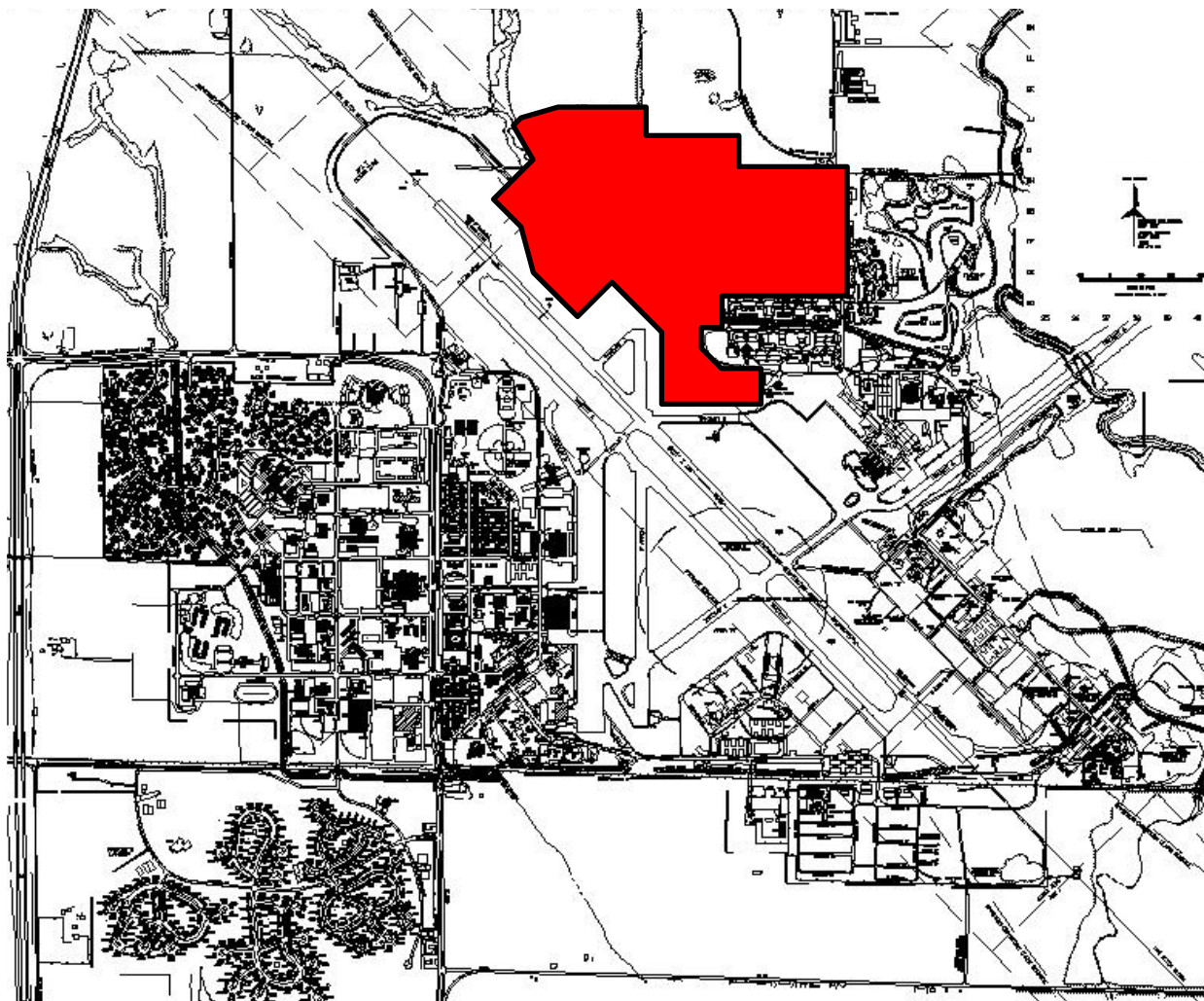
# *Process*

- **Confirm results of Apr 02 study**
- **Consult with appropriate personnel**
- **Tour proposed project site to determine actual green and tee locations and fairway corridors**
- **Identify key project constraints to successfully eliminating airfield safety issues**
- **Develop concept plan and final recommendations**



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# *Site Location*



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# *Summary of Applicable Criteria*

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## ■ **AFI 32-7063, Airfield Installation Compatible Use Zone**

- Height obstruction constraints prohibit any natural or man-made structures that protrude above the *primary surface* or *clear zone* surface.

## ■ **UFC 3-260-01, Airfield & Heliport Planning & Design**

- Table 3.5 Clear Zones: Width of *Clear Zone* is 3000' or 1500' either side of centerline of runway.
- Table 3.7 Airspace Imaginary Surfaces (Approach-Departure Clearance Surface): *Primary Surface* width is 2000' or 1000' either side of centerline of runway.



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# *Applicable Airfield Waiver*

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## ■ ***Number: SC 5010***

- Description: Golf Course
- Date Granted: 27 Aug 1964
- Violation: Lateral Safety Zone and Airfield Clear Zone
- Granting Agency: MATS/MAMCE



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# *Airfield Encroachments*

## ■ **Primary Surface**

- Hole 8: Entire Hole
- Hole 9: Entire Hole
- Hole 10: Partial (No changes required)
- Hole 12: Green & Approach
- Hole 13: Back Tee Box
- Hole 14: Green & Most of Fairway
- Hole 15: Tee Box

## ■ **Clear Zone**

- Hole 1: Tee Box
- Hole 7: Green
- Clubhouse
- Parking
- Cart Barn
- Putting Green
- Practice Area
- Driving Range





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# *Course Areas in Primary Surface*



*Hole No. 8 looking towards flightline*



*Hole No. 14 tee box*



*Hole No. 9 fairway landing area*

**Apr 02 photos**





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# *Demolished Housing Area*



*View from West*



*View of Cardinal Creek  
where proposed new  
bridge will be constructed*



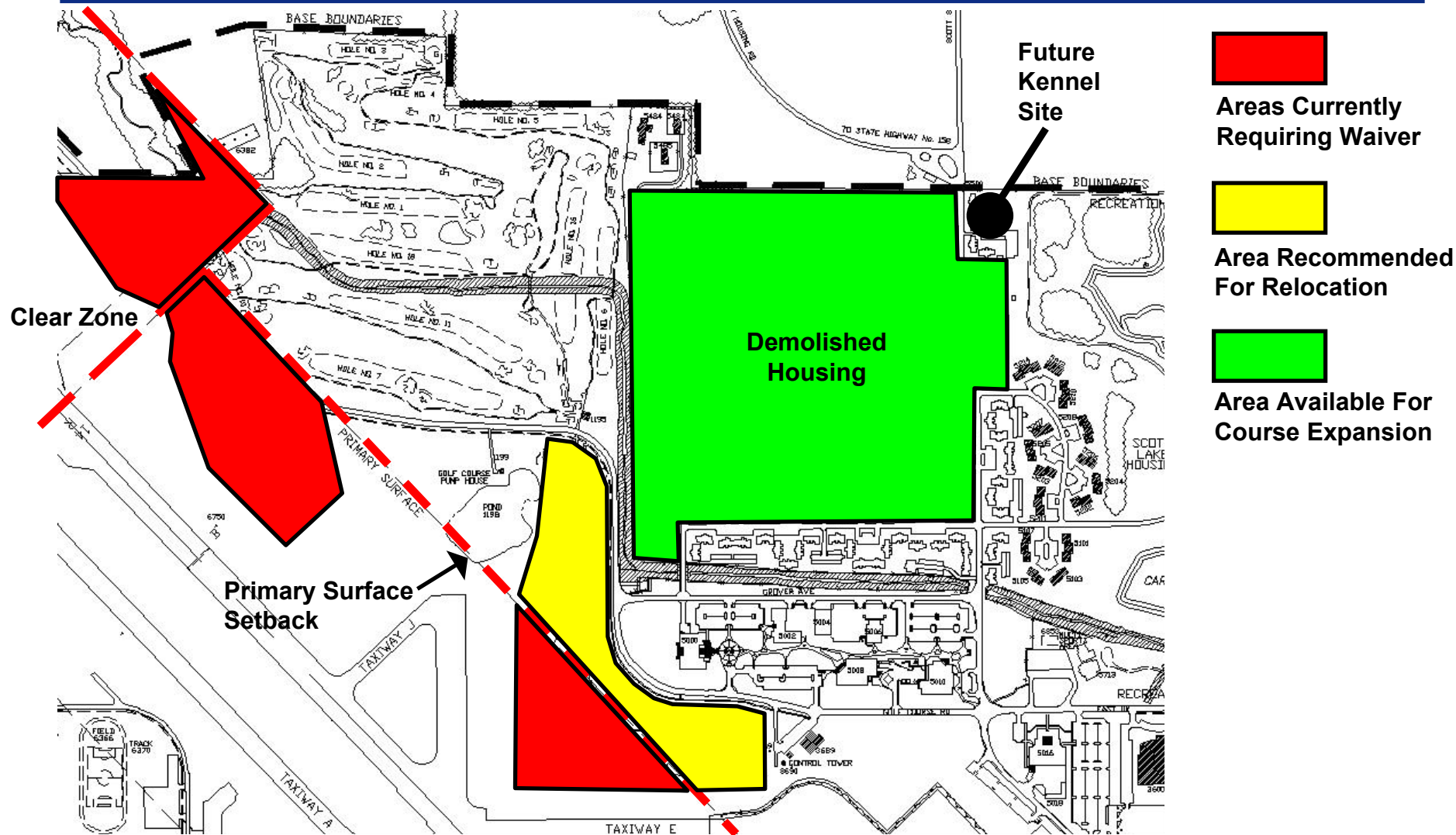
*View from North*

**Apr 02 photos**



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# Opportunities & Constraints Map





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# *Recommendations*

## ■ Option 1

- Construct 6 new golf holes in demolished housing area
- Demolish 6 existing holes within primary surface parking
- Relocate/rebuild 3 greens & 3 tees
- Reverse the tee & green location for existing holes
- Eliminate drainage problem for existing holes 7 & 11
- Construct new irrigation or water pump house
- Construct new clubhouse
- Realign existing maintenance road
- Construct the following new facilities:
  - Clubhouse
  - Cart Barn
  - Driving Range
  - Putting green
  - Practice Area
  - Parking

**No longer a viable alternative**





**No longer a viable alternative**

Hand-drawn site plan for a golf course. The plan includes various features and boundaries:

- Installation Boundary:** Indicated by a dashed line.
- Green Features:** New Tee, New Green, New Fairway, New Putting Green, New Club House, New Cart.
- Water Features:** Irrigation Pond, Slope Course Pump House, New Bridge, Practice Area.
- Other Features:** Tree Line, Grain Ave., Bar.





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# *Parametric Cost Estimate (Option 1)*

Course Alterations	\$3,965,000
Supporting Facilities	\$1,800,000
Subtotal	\$5,765,000
Contingency (5%)	\$288,000
Total Contract Cost	\$6,053,000
SIOH (5.7%)	\$345,000
Total Request	<u>\$6,398,000</u>
<b>Total Request (Rounded)</b>	<b>\$6,400,000</b>
Equip. from other Appropriations	(\$500,000)
Environmental Impact Analysis	(\$100,000)



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# *Recommendations*

- **Option 2 with revisions (in red)**
  - Construct 6 new golf holes in demolished housing area (Maximum funds available: \$1.5M)
  - Abandon 6 existing holes within primary surface setback
  - Relocate/rebuild 3 greens & 3 tees (**Unnecessary and eliminated to save funds on new project**)
  - Reverse the tee & green locations on 2 existing holes (**Unnecessary and eliminated to save funds on new project**)
  - Eliminate drainage problem areas @ existing holes 7 & 11 and utilize excavated soil for construction of new holes
  - Construct new ponds in demolished housing area and utilize excavated soil for construction of new holes
  - Construct new bridge
  - Realign existing maintenance road (**Unnecessary in revised Option 2 concept plan**)





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# Conceptual Feasibility Plan (Option 2)



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# Concept Plan (Option 2 Revised)







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# *Demolished Housing Area*



*Example of a large tree requiring removal*



*Typical “corridor” for new golf hole construction*



*Tree to be preserved with slab in foreground*

**May 03 photos**



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# *Key Issues*

- **Budget**
- **Chlordane**
- **County-funded demolition project**



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# *Key Issue #1 of 3*

## ■ **Budget (Maximum funds available: \$1.5M)**

### ■ **Potential ideas to trim costs...**

- Eliminate reversing holes #7 & 11 (Savings- \$150K)
- Site sensitive routing of new holes to minimize significant tree removal
- Minimalist design style to match design style of 12 holes to remain
- Utilize sod/sprigs from abandoned holes' fairways & greens
- Limit golf architect design requirement to only detailed greens complexes and mass grading for positive drainage
- Use PRIME BEEF exercises to clear and grub small trees and other miscellaneous unwanted vegetation
- Chip all woody vegetation and use on site to mulch "natural" areas between fairway corridors
- Phasing of new NAF funded course-wide irrigation, Phase I- 12 holes to remain; Phase II- 6 new holes (Savings- \$450-600K)



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## *Key Issue #2 of 3*

### ■ **Chlordane**

- **Current clean-up plan is to cover slabs with 6” of topsoil after demolition which has been deemed insufficient to allow for some manipulation of the groundplane to ensure positive drainage on new holes**
- **Proposal- Remediate contaminated soil only under slabs within proposed fairway corridors, greens complexes, and teeing areas**
- **Ideas to accomplish:**
  - Dig a hole, bury contaminated soil. (Create a state-regulated landfill on site.)
  - Add to ANG-created “Mount Chlordane”
  - Dispose of contaminated soil at licensed site in state
  - Import adequate soil to accomplish positive drainage





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## *Key Issue #3 of 3*

- **County-funded demolition project**
  - **Recently awarded**
  - **Planned to remove slabs and cover slab area with a minimum of 6” of topsoil as remediation for chlordane**
  - **Largest street “loop” currently will be preserved in awarded contract**
    - Desire is to trade northeast quadrant of the “loop” where it interferes with proposed hole #12 for a smaller “loop” in the northernmost part of the northeast quadrant (issue is being worked by installation chief of design)



## *Parametric Cost Estimate\* (Option 2 Revised)*

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<i>6 Newly Constructed Golf Holes</i>	<i>\$1,300,000</i>
<i>Supporting Facilities (Bridge)</i>	<i>\$25,000</i>
<i>Subtotal</i>	<i>\$1,325,000</i>
<i>Contingency (5%)</i>	<i>\$66,250</i>
<i>Total Contract Cost</i>	<i>\$1,391,250</i>
<i>SIOH (5.7%)</i>	<i>\$79,301</i>
<i>Total Request</i>	<i><u>\$1,470,551</u></i>
<b><i>Total Request (Rounded)</i></b>	<b><i><u>\$1,500,000</u></i></b>

*\* Estimate is extrapolated from Golf Course Builders of America-created “normal” construction costs for Region 3- Central Plains and does not include irrigation*

<i>Environmental Impact Analysis</i>	<i>(\$30,000)</i>
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# *Proposed Schedule*

## **ACTION**

## **START**

## **COMPLETE**

***Concept Design***

***May 03***

***May 03***

***Environmental Impact Analysis***

***Jun 03***

***Nov 03***

***Submit 1391***

***Jun 03***

***Oct 03***

***35% Design***

***Feb 04***

***Jun 04***

***Final Design***

***Dec 04***

***Oct 05***

***Authority to Advertise***

***Nov 05***

***Nov 05***

***Advertise***

***Dec 05***

***Mar 06***

***Award Construction Contract***

***Apr 06***

***Apr 06***

***Construction***

***May 06***

***Dec 07***

***Grow-In Period***

***Dec 07***

***Oct 08***



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# *Summary*

- **Airfield safety issues driving project need**
- **Prospect of the feasibility of 6 new holes is still positive**
- **Potential of key issues to determine success or failure is great**
- **Consider using AFCEE to facilitate hiring and managing environmental consultant, golf architect, and golf course builder**
- **...when all other alternatives are exhausted, the USAF could decide to abandon all but 9 holes**



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# *Team Members*

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## ***Apr 02 Assistance Team***

<b><i>Mr. George Gregor</i></b>	<b><i>436<sup>th</sup> CES</i></b>	<b><i>Dover AFB</i></b>
<b><i>Mr. Randy Lierly</i></b>	<b><i>HQ AFCEE</i></b>	<b><i>Brooks AFB</i></b>
<b><i>Mr. Bill Bushman</i></b>	<b><i>HQ AFCEE</i></b>	<b><i>Brooks AFB</i></b>

## ***May 03 Site Visit***

<b><i>Mr. Bill Bushman</i></b>	<b><i>HQ AFCEE</i></b>	<b><i>Brooks AFB</i></b>
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Prepared for the 375<sup>th</sup> Civil Engineer Squadron  
by  
**Headquarters Air Force Center for Environmental Excellence**



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